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Designing Gamified Learning Activities on Digital Teaching in Higher Education

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1 Introduction

In recent years, due to the Covid-19 pandemic, higher education has been challenged to rethink and reconvert its teaching and assessment practices [1, 2, 3]. Both distance or hybrid modes entered university teaching, involving a massive use of digital technologies [4], and determining social [5, 6] and psychological [7] conditions that have heavily influenced the students' approach to university life. In particular, a sense of declining motivation is reported in several studies [8, 9, 10], urging teachers to find new strategies for engaging students. This contribution intends to present an experience conducted by the authors in the course of "Nuove Tecnologie per l'Educazione e la Formazione" held by Prof. Maria Ranieri at the University of Florence in hybrid mode.

2 Gamification to promote learning and engagement

Gamification was a key ingredient of the course. As well known, gamification refers to "the use of game design elements in non-game contexts" [11, p.10]. It is, therefore, a manipulation of playfulness, intentionally pursued in the design phase, using the game as an educational tool. Clearly, it doesn't happen only by adding points and badges but it requires a preliminary design effort taking into account: how the game is used, its design and elements, the player characteristics and the academic context in which it is applied. This means that the task of the university teacher is not simply to build tools, but to design meaningful learning experiences, characterized by learning by doing; to develop forms of intrinsic motivation to learn; to offer the possibility of conveying knowledge by providing enjoyment; to maintain the authenticity of university instructional design oriented by specific learning goals; to leverage the autonomy of attending students within the process, fostering self-efficacy and self-esteem [12]; and make post-covid university teaching increasingly inclusive and engaging [13].

3 Instructional design of course activities

The designed model was delivered during the five lectures of the course, taking up two of the total four hours of each lesson and addressing topics covered in one of the

examination books [14]: Special Needs Education (SEN), game-based learning, design of game mechanics and gamification in education. It was based on three assumptions [15, 16]: a) the relevance of mobilizing pre-existing knowledge, b) the importance of providing learners opportunities to apply knowledge, and c) the value of formative assessment for authentic learning, and involved three phases per lesson: a) introduction to the topics of digital technology for inclusive education, b) collaborative learning activities, and c) formative assessment of results and scoring (Table 1). Game design elements were introduced in each lesson in terms of challenges, winners and scores.

Lesson	(a) Activation	(b) Application	(c) Assessment
#1	SEN	Collaborative creation of inclusive avatar	Peer Evaluation
#2	SEN & Learning	Observation of game-based digital tools	Automatic Feedback
#3	Videogame education	Analysis of the game mechanics of an educational videogame	Self- and Expert Evaluation
#4	Game elements	Writing assignment of a Game play	Peer Evaluation
#5	Gamification	Design of an educational, digital and inclusive game	Expert and Peer Evaluation

Table 1. Summary of key elements of the course design.

The Moodle platform was used for the general presentation, technical instructions and rules for each phase. As for the five activities, their assessment and reward methods, both internal features (workshop, quiz, assignment, rubric, badges) and external tools (digital bulletin boards, student response systems, forms) were used to create the tasks to be performed collaboratively. Attending students (n=203) were assigned to 20 teams and given instructions for the gamified progression in the course represented by leaderboard, points and grading criteria. Though results on students' satisfaction and learning are still under analysis, it can be observed that a high level of attendance characterized the course with all students participating in a no mandatory course until the end of an intense experience.

4 Conclusion

New challenges are arising on the horizon of higher education systems. Reshaping traditional practices of teaching to increase the quality of education and (re-)engage students, after a tough period of unplanned events, has become a priority for academic institutions. Gamification may provide opportunities to renew university teaching leveraging on students' participation and engagement. The experience presented here was based on the integration of gamified elements in a course on inclusive digital education. Further studies will be necessary to unlock the pedagogical potential of gamification for higher education.

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